## REMARKS

Reconsideration of this application, based on this amendment and these following remarks, is respectfully requested.

Claims 3 through 10, 13, 15 through 18, and 28 through 32 are now in this case. Claims 3 through 5, and 13, are amended. Claims 26 and 27 are newly canceled. Claims 31 and 32 are added.

The allowance of claims 8 through 10 is noted.

Claims 4 through 7 were objected to as depending on a canceled claim. Claims 4 and 5 are amended to now depend on claim 3, as suggested by the Examiner. Applicants submit that this amendment to claims 4 and 5 obviates the objection to these claims.

Claims 3 through 7, and 15 through 17 were rejected under §102(a) as anticipated by the Graham et al. reference.[1] Claim 18 was rejected under §103 as unpatentable over the Graham et al. reference in view of the Pua et al. reference[2]. Claims 28 through 30 were rejected under §103 as unpatentable over the Graham et al. reference in view of the Watanabe reference[3].

Claims 26 and 27 are canceled to advance the prosecution of this case.

Claim 3 is amended to further clarify its patentability over the prior art. Amended claim 3 now further defines the firmware that is incorporated into the memory storage device, as being for controlling the storing of data and executing of instructions on the memory storage device.

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[1] International Publication Number WO 01/78020 A1, published 18 October 2001. Upon further investigation of the Graham reference, however, Applicants have become aware of U.S. Patent No. 6,402,028 B1, issued June 11, 2002 to Graham, Jr., et al., based on a U.S. patent application filed on April 6, 1999. This U.S. Patent 6,402,028 appears to substantially correspond to, and is substantially cumulative to, Graham PCT reference applied against the claims. Accordingly, while Applicants will present argument relative to the Graham PCT reference applied against the claims because of the existence of the Graham, Jr. et al. U.S. Patent, Applicants do not admit that the Graham PCT reference is prior art against the claims in this case.

[2] U.S. Patent Publication No. 2002/0194403 A1, published December 19, 2002 from an application filed June 15, 2001.

[3] U.S. Patent No. 6,148,366, issued November 14, 2000 to Watanabe, from an application filed November 24, 1997.

6

The specification clearly supports this definition of firmware,[4] and as such no new matter is presented.

The Examiner again asserts that the Graham et al. reference teaches, among other elements of claim 3, the steps of embedding of new firmware into a first command, and of extracting of the embedded new firmware from that first command at a reader. In response to their previous argument, the Examiner indicates that the teachings of the Graham et al. reference:

> A terminal may be a non-intelligent device that simply provides power to a card and facilitates the transfer of information, or may be as complex as a merchant terminal that includes a processor, application software, and the ability to communicate over a network.[5]

"clearly indicate[] extraction of embedded information", because "[i]nformation is coming over the network to the reader (the terminal), which then must be converted from network format to memory device (card) format."[6]

Applicants disagree that this passage of the reference, or its interpretation asserted by the Examiner, disclose the embedding and extracting steps. First, amended claim 3 requires that the firmware is embedded within a first command. The mere reformatting of information from one format into another does not mean that the information is embedded within a command, as required by claim 3, nor does it mean that the information is extracted from that command, also as required by claim 3. One can look to conventional network communications (e.g., Ethernet, ATM communications, etc.) for examples of such format conversion that do not involve extraction of information embedded within a command. Because format conversion of data does not necessarily involve embedding and extraction, and because the Graham et al. reference elsewhere fails to disclose the embedding and extracting steps of claim 3, Applicants respectfully submit that claim 3 is novel over the Graham et al. reference, and that the §102 rejection of claims 3 through 7 on this basis is in error.

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[4] Specification of S.N. 10/005,740, page 3, lines 29 and 30; page 9, line 29 through page 10, line 1.
[5] Graham et al., *supra*, page 38, line 26 through page 39, line 2.
[6] Office Action of December 19, 2005, page 5.

7

To advance the prosecution of this application, however, Applicants have further amended claim 3 to now recite that the firmware incorporated into the memory storage device according to the claimed method is for controlling the storing of data and executing of instructions on the memory storage device. To the extent that the Graham et al. reference teaches the installing of software into a memory storage device, Applicants submit that its teachings nowhere disclose or suggest the installing of firmware, much less firmware for controlling the storing of data and executing of instructions on that memory storage device.

In this regard, from a general sense, Applicants submit that the skilled artisan, upon reading amended claim 3, would readily understand that the firmware of amended claim 3 is substantially different and distinct than the applications described in the Graham et al. reference. The term "firmware" connotes, in the art, program instructions that control the low-level operation of a device, for example such instructions for "how the device communicates with the other computer hardware"[7], and resides under the operating system (*e.g.,* to the extent of controlling the loading of the operating system itself).[8] Examples of firmware, as would be known to the skilled reader, include the BIOS for personal computers, and the like.[9] The firmware of amended claim 3, now recited as being for controlling the storing of data and executing of instructions on the memory storage device, clearly falls within this definitional understanding of the skilled artisan.

On the other hand, the Graham et al. reference discloses the installation of application programs onto memory devices, such as a "smart card".[10] Applicants submit that such application programs are not firmware, as required by amended claim 3, nor do they control the storing of data and executing of instructions on the memory storage device. Rather, these application programs as taught by the Graham et al. reference are higher-level application programs, such as those written in high-level programming languages such as JAVA, assembly

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[7] "Firmware", *Sharpened Glossary*, http://www.sharpened.net/glossary/definition.php?firmware.
[8] "Definition: firmware", *The Free On-line Dictionary of Computing* (2003), http://dict.die.net/firmware/.
[9] "Firmware", http://en.wikipedia.org/wiki/Firmware.
[10] Graham et al., *supra*, Abstract.

8

language, Visual Basic, C, and the like.[11]  The loading of application programs onto any computing system is a substantially different, and substantially less complicated, task than is the updating of low-level control software such as firmware, as is evident to any user of personal computers.[12]  For these reasons, Applicants respectfully submit that the firmware of amended claim 3, and especially such firmware as now recited by the claim that is for controlling the storing of data and executing of instructions on the memory storage device, are not application programs as taught by the Graham et al. teachings.  And Applicants therefore submit that the teachings of the Graham et al. reference regarding the loading of application programs do not meet the requirements of amended claim 3, which include the embedding of firmware into a first command, the extracting of the firmware from that first command, and the incorporating of that firmware into the memory storage device, especially where such firmware is for controlling the storing of data and executing of instructions on the memory storage device.

Accordingly, Applicants submit that the teachings of the Graham et al. reference fall short of the requirements of amended claim 3 and its dependent claims.  Applicants therefore respectfully submit that these claims are novel over the Graham et al. reference.

Applicants further respectfully submit that there is no suggestion from the prior art to modify the teachings of the Graham et al. reference in such a manner as to reach amended claim 3.  In this regard, Applicants submit that the task of updating firmware is so substantially different, and more difficult, than the loading of application programs, that the skilled artisan having reference to the Graham et al. reference would have no idea on how to effect such updating.  Evidence of this difficulty is presented in the specification of this application itself,[13] which teaches that conventional firmware upgrades required physical shipment of the memory storage device itself to its manufacturer.  The other references cited against the claims add no teachings in this regard.  As such, nowhere does the prior art suggest any approach for the user to perform the firmware upgrade, much less by way of a reader that extracts the new firmware from

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[11] Graham et al., *supra*, page 38, lines 7 through 10.
[12] *See also Free On-line Dictionary, supra* ("Easier to change than hardware but harder than software stored on disk.").
[13] Specification, *supra*, page 1, line 22 through page 2, line 8.

9

a host command within which the firmware is embedded, and then forwards the firmware to the memory storage device, as required by amended claim 3. Accordingly, Applicants submit that amended claim 3 and its dependent claims are not only novel, but are patentably distinct over the Graham et al. reference and the other prior art of record in this case.

Claim 13 is similarly amended as claim 1, to advance the prosecution of this application by clarifying its patentability over the Graham et al. reference and the other prior art of record in this case. Claim 13 now recites that both the installed and new firmware are for controlling the storing of data and executing of instructions on the memory storage device. As discussed above relative to claim 3, the specification clearly supports this amendment to claim 13, and as such no new matter is presented by this amendment to claim 13.

First, as also discussed above relative to claim 3, Applicants submit that the Examiner's assertion regarding the teachings of the Graham et al. reference regarding the embedding and extracting of firmware from a first command is misplaced. In this regard, the mere reformatting of information from one format into another simply does not correspond to the embedding of that information into a command, and its extracting, as asserted by the Examiner. Applicants submit that various ways in which such information is communicated over a network are known, including simply arranging the information into blocks or packets, does not involve the embedding of the information into a command. Such network communications do not necessarily embed and extract information within commands. Nor does the Graham et al. reference otherwise disclose any means for embedding new card firmware into a first command, or means for extracting that firmware from the command, as required in the system of amended claim 13. For this reason, Applicants respectfully submit that claim 3 is novel over the Graham et al. reference, and that the §102 rejection of claims 3 through 7 on this basis is in error.

Second, as noted above, Applicants submit that the application programs of the Graham et al. reference are not firmware, within the meaning of claim 13 or within the understanding of those skilled in the art. The skilled reader will readily comprehend that firmware and application programs are two different things. On one hand, firmware refers to program instructions that control the low-level operation of a device, such as in communicating with the other computer

10

hardware[14], and that resides under the operating system and is operable to load the operating itself upon a power-up or reboot.[15]. And amended claim 13 now clearly refers to its firmware, both installed and new, in this manner, as being for controlling the storing of data and executing of instructions on the memory storage device. These functions not only correspond to the common understanding of firmware, but they further distinguish the firmware of the claim from the application programs disclosed by the Graham et al. reference.

As discussed above relative to amended claim 3, the Graham et al. applications are much higher-level application programs and are in high-level programming languages such as JAVA, assembly language, Visual Basic, C, and the like.[16] Nor do these application programs control the storing of data and executing of instructions on a memory card, as now claimed. Those skilled in the art would also readily recognize that the loading of applications onto a system is a trivially easy task, as compared to the updating of system firmware. Indeed, while users of conventional flash memory cards could readily install application programs on such devices, these users were required to return these flash memory cards to the manufacturer in order to upgrade the firmware. Applicants therefore respectfully submit that the system of amended claim 13, which includes means for embedding and extracting firmware, does not correspond to the system of the Graham et al. reference, in which new application programs are simply loaded onto its smart card memory devices.

Accordingly, Applicants submit that the teachings of the Graham et al. reference fall short of the requirements of amended claim 13 and its dependent claims. Applicants therefore respectfully submit that these claims are novel over the Graham et al. reference.

Applicants further respectfully submit that there is no suggestion from the prior art to modify the teachings of the Graham et al. reference in such a manner as to reach amended claim 13, considering that the updating of firmware is substantially different, and more difficult, than is

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[14] "Firmware", *Sharpened Glossary*, *supra*.
[15] "Definition: firmware", *Free On-line Dictionary*, *supra*.
[16] Graham et al., *supra*, page 38, lines 7 through 10.

11

the loading of application programs. As discussed above, and as taught by the specification,[17] this difficulty required conventional firmware upgrades to be accomplished by the user shipping the memory cards to the manufacturer. Nowhere does any of the prior art, including the Graham et al. reference and the other references cited against the claims, suggest any way to modify the teachings of the Graham et al. reference in such a manner as to reach the system of amended claim 13. Accordingly, Applicants submit that amended claim 13 and its dependent claims are not only novel, but are patentably distinct over the Graham et al. reference and the other prior art of record in this case.

Claims 31 and 32 are added, dependent on claim 13, to more completely cover all aspects of Applicants' invention. New claim 31 further requires that the memory card include a flash memory and a controller, and that the firmware is for allowing instructions to be executed by the controller. And claim 32 further requires, relative to claim 31 upon which it depends, that this firmware includes in-system programming (ISP) support. Considering the support for these elements in the specification,[18] no new matter is presented by these new claims 31 and 32. And Applicants further respectfully submit that these new claims 31 and 32 are even further novel and patentably distinct over the Graham et al. reference and the other prior art, considering that these references are silent regarding the upgrading of firmware of any sort, much less such firmware for allowing instructions to be executed by the controller, or as including ISP support.

Applicants therefore respectfully submit that new claims 31 and 32 are novel and patentably distinct over the prior art of record in this case.

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[17] Specification, *supra*, page 1, line 22 through page 2, line 8.
[18] Specification, *supra*, page 9, line 29, through page 10, line 6.

12

For all of the above reasons, Applicants respectfully submit that all claims now in this case are in condition for allowance. Reconsideration of this application is therefore respectfully requested.

Respectfully submitted,

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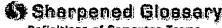
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13

## Sharpened Glossary
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# Firmware

Firmware is a software program or set of instructions programmed on a hardware device. It provides the necessary instructions for how the device communicates with the other computer hardware. But how can software be programmed onto hardware? Good question. Firmware is typically stored in the flash ROM of a hardware device. While ROM is "read-only memory," flash ROM can be erased and rewritten because it is actually a type of flash memory.

Firmware can be thought of as "semi-permanent" since it remains the same unless it is updated by a firmware updater. You may need to update the firmware of certain devices, such as hard drives and video cards in order for them to work with a new operating system. CD and DVD drive manufacturers often make firmware updates available that allow the drives to read faster media. Sometimes manufacturers release firmware updates that simply make their devices work more efficiently.

You can usually find firmware updates by going to the "Support" or "Downloads" area of a manufacturer's website. Keeping your firmware up-to-date is often not necessary, but it is still a good idea. Just make sure that once you start a firmware updater, you let the update finish, because most devices will not function if their firmware is not recognized.

← Firewire | Flash →

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## Definition: firmware

Search dictionary for firmware

Source: *WordNet (r) 1.7*

firmware
     n : (computer science) coded instructions that are stored
       permanently in read-only memory

Source: *The Free On-line Dictionary of Computing (2003-OCT-10)*

Firmware

    Software stored in read-only memory (ROM) or programmable ROM
    (PROM). Easier to change than hardware but harder than
    software stored on disk. Firmware is often responsible for
    the behaviour of a system when it is first switched on. A
    typical example would be a "monitor" program in a
    microcomputer which loads the full operating system from disk
    or from a network and then passes control to it.

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Source: *Jargon File (4.3.1, 29 Jun 2001)*

firmware /ferm'weir/ n. Embedded software contained in EPROM or flash
   memory. It isn't quite hardware, but at least doesn't have to be loaded
   from a disk like regular software. Hacker usage differs from straight
   techspeak in that hackers don't normally apply it to stuff that you
   can't possibly get at, such as the program that runs a pocket
   calculator. Instead, it implies that the firmware could be changed, even
   if doing so would mean opening a box and plugging in a new chip. A
   computer's BIOS is the classic example, although nowadays there is
   firmware in disk controllers, modems, video cards and even CD-ROM
   drives.

# Firmware

From Wikipedia, the free encyclopedia

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> wikifying.

In computing, **firmware** is software that is embedded in a hardware device. It is often provided on flash ROMs
or as a binary image file that can be uploaded onto existing hardware by a user.

Firmware is defined as:

- the computer program in a read-only memory (ROM) integrated circuit (a hardware configuration is
  usually used to represent the software);
- the erasable programmable read-only memory (EPROM) chip, whose program may be modified by special
  external hardware, but not by [a general purpose] application program.

Source: Federal Standard 1037C.

The term "firmware" was originally coined to indicate a functional replacement for hardware on low cost
microprocessors.

Note that firmware for many devices can now be updated without the need for additional hardware, often through
the use of vendor-provided software.

In practical terms, firmware updates can improve the performance and reliability, indeed even the basic available
functionality of a device, and many devices benefit from regular firmware updates. One of the most common
devices to have regular firmware updates are recording devices such as optical media writers (DVD, CD, Bluray),
as media technologies extend, so firmware updates ensure hardware is kept up to date and compatible.

Examples of firmware include:

- the BIOS found in IBM-compatible Personal Computers;
- the EFI BIOS found on Itanium systems, and as a secondary bootloader (which runs after the traditional
  BIOS) on x64 PCs;
- Open Firmware, used in computers from Sun Microsystems and Apple Computer;
- ARCS, used in computers from Silicon Graphics;
- RTAS (Run-Time Abstraction Services), used in computers from IBM;
- the Common Firmware Environment (CFE).

Open Firmware is notable for being written in the Forth programming language.

## External links

- The Firmware Page (http://www.rpc1.org/)
- Firmware Definition (http://www.sharpened.net/glossary/definition.php?firmware) Sharpened Glossary
- Firmware Updates for Optical Media devices (http://www.disc-info.com/content/view/12/28/)

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